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EXAMINER	
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BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Application Number: 09/819,787
Filing Date: March 28, 2001
Appellant(s): CHAMBERLIN ET AL.

Burton A. Amernick
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed 6/29/2004.

(1) Real Party in Interest

A statement identifying the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

A statement identifying the related appeals and interferences, which will directly affect or be directly affected by or have a bearing on the decision in the pending appeal is contained in the brief.

(3) Status of Claims

The statement of the status of the claims contained in the brief is correct.

(4) Status of Amendments After Final

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

(5) Summary of Invention

The summary of invention contained in the brief is correct.

(6) Issues

The appellant's statement of the issues in the brief is correct.

(7) Grouping of Claims

Appellant's brief includes a statement that the pending claims stand or fall together.

(8) Claims Appealed

The copy of the appealed claims contained in the Appendix to the brief is correct.

(9) Prior Art of Record

5,770,103	WANG et al	06-1998
5,804,513	SAKATANI et al	09-1998

(10) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

Claims 19-24, 26-27, 32-33 and 37-38 are rejected under 35 U.S.C. 102(b) as being anticipated by Wang et al (5,770,103).

As to claim 19, Wang et al disclose a method for polishing metal, wherein the metal substrate is contacted with a polishing pad and slurry is used to polish the metal including abrasive particles and an oxidizing agent such as potassium iodate (col.2, lines 17-22 and lines 32-41 and example 1).

Wang et al also disclose that abrasive particles may be comprised of any of the oxides such as alumina, silica, ceria and zerconia at about 0.01 % to about 15 % by weight (col.2, line 23-31).

Wang et al further disclose that the pH of the slurry is maintain at about 1 to about 7 (col.3, lines 8-12).

Wang et al inherently teach that the property of the oxidizing agent such as the static etch rate on metal is less than 1000 Angstrom per hour because the oxidizing agent (potassium iodate) used by Wang et al is exactly same with the applicant's oxidizing agent.

As to claim 20, Wang et al teach that the oxidizing agent is present at about 0.01% to about 10% or 0.1 g/L to about 100 g/L (col.2, lines 36-39).

As to claim 21, Wang et al teach that the abrasive particles are present in the composition of about 0.01% to about 15% by weight (col.2, lines 26-27).

As to claims 22-23, the oxidizing agent comprises potassium iodate (col.2, lines 40-41).

As to claims 24,26 and 27, Wang et al teach that the slurry is aqueous slurry (col.1, lines 62-65) and the abrasive particle comprises alumina or silica or ceria (col.2, lines 23-30).

As to claims 32-33, Wang et al teach that the polishing is performed to a metal/dielectric composite (col.1, lines 33-45) but fail to teach the etching ratio of metal relative to the dielectric.

As to claim 37, Wang et al teach that the metal substrate could comprises tungsten or copper or aluminum and dielectric is typically silicon dioxide in a metal/dielectric composite structure (col.1, lines 41-45 and col.4, lines 30-32).

As to claim 38, Wang et al teach that the wafer carrier rotates about 50 rpm and the polishing table with pad rotates about 40 rpm (col.3, lines 23-25).

Claims 19-25, 28-31, 34-36 and 39 are rejected under 35 U.S.C. 102(e) as being anticipated by Sakatani (5,804,513).

As to claim 19, Sakatani et al disclose a method for polishing metal using slurry including an abrasive composition comprising an oxidizing agent and abrasive particles (col.4, lines 3-9).

Sakatani et al disclose that the metal substrate is contacted with a polishing pad (col.7, lines 52-57).

Sakatani et al also disclose the pH of the composition is about 7 (col.3, lines 61-63).

Sakatani et al inherently teach that the property of the oxidizing agent such as the static etch rate on metal is less than 1000 Angstrom per hour because the oxidizing agent (iodates) used by Sakatani et al is exactly similar with the applicant's oxidizing agent.

As to claims 20-21, Sakatani et al disclose that oxidizing agent is preferably used in amount of about 0.5% by weight to about 15% by weight and the abrasive particle is about 5 to about 40% by weight (col.3, lines 42-45 and col.4, lines 12-15).

As to claims 22-23, Sakatani et al teach that the oxidizing agent comprises iodate that broadly includes potassium iodate (col.4, lines 7-9).

As to claim 25, the abrasive particles have a particle size of about 0.1 to about 1.5 micrometer or 100nm to about 1500nm (col.3, lines 39-41).

As to claims 28-31, Sakatani et al teach that organic solvent such as ethanol or methanol is used in the polishing slurry composition for preparing the abrasive suspension (col.4, lines 55-58).

As to claim 34, Sakatani et al teach that polishing of the metal layer is performed immediately preceding the deposition of a dielectric layer (2) (col.1, lines 57-col.2, lines 2).

As to claims 35-36, Sakatani et al teach that an adhesion-promoting layer such as titanium nitride is polished during the polishing process (col.2, lines 1-4).

As to claim 39, Sakatani et al teach that the abrasive particles includes silicon oxide or silica (col.3, lines 30-35).

(11) Response to Argument

Appellant argues that Wang et al fail to disclose a polishing method using a polishing composition with a slurry comprising abrasive particles in combination of employing a pH of about 5 to about 11 along with selecting an oxidizing agent having a static etch rate on metal of less than 1000 Angstroms per hour.

In response to the appellant's argument, examiner states that the argument is not persuasive because Wang et al does teach a polishing slurry comprising an oxidizing agent (potassium iodate) (col.2, lines 32-41) and the pH of the polishing composition is about 1 to about 7 (col.3, lines 8-12) and the abrasive particles can be silica or alumina (col.2, lines, 23-26).

Examiner also states that it is true that Wang et al do not explicitly teach that the oxidizing agent has a static etch rate on metal of less than 1000 Angstroms per hour but this is an inherent property of the oxidizing agent because the oxidizing agent (potassium iodate) used by Wang et al is exactly same as the appellant's oxidizing agent (see the rejection).

Appellant argues Wang et al's composition exhibit higher etch rates than the claimed one and that Wang's polishing composition exhibit a higher etch rate and having a pH less than 5 in the examples.

In response, examiner states that the argument is not persuasive because Wang et al clearly teach that the preferable oxidizing agent is potassium iodate (col.2, lines 39-

41), which is exactly same as the instant invention and will inherently provide the static etch rate on metal less than 1000 Angstroms.

Examiner, further states that the use of a preferred pH in examples do not exclude the use of other provability, wherein the reference teaches the pH of the slurry is maintain at about 1- about 7 (col.3, lines 8-12).

Appllant also argues that none of the cited references suggest the invented slurry composition can polish both metal and silicon dioxide at substantially the same rates.

In response to appellant's argument, examiner states that Wang et al's composition may include such compound that increase the removal rate of the metal and suppress the rate of dielectric but the addition of such compound could be optional and if they are added the pH of the composition can be adjusted differently (col.3, lines 8-17).

Therefore, it is expected that Wang's composition is capable of removing the metal and the dielectric at substantially the same rate because the composition and the material to be remove are exactly the same as the invented one.

Appllant argues that Sakatani fails to anticipate claim 19 including the limitation of claim 32 of" a method for polishing both metal and dielectric material at substantially the same rate".

In resoonse, examiner states the polishing property of Sakatani et al's composition inherently teach that the polishing rate of the metal and the dielectric material at substantially same rate because all the processing constituents including the polishing composition are exactly same as the instant invention.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

Shamim Ahmed
Examiner
Art Unit 1765

SA
September 15, 2004

Conferees

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